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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,479	07/16/2003	Steven G. Johnson	13445-002002	9196

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EXAMINER	
CONNELLY CUSHWA, MICHELLE R	
ART UNIT	**PAPER NUMBER**
2874	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,479	JOHNSON ET AL.	
	Examiner	Art Unit	
	Michelle R. Connelly-Cushwa	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,63-65 and 69-72* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,63-65 and 69-72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0703*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The prior art documents submitted by applicant in the Information Disclosure Statement filed on July 16, 2003 have all been considered and made of record (note the attached copy of form PTO-1449).

Drawings

Eleven (11) sheets of formal drawings were filed on July 16, 2003 and have been accepted by the Examiner.

Specification

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,625,364 B2.

Although the conflicting claims are not identical, they are not patentably distinct from each other because all of the limitations of claim 1 of the present application are disclosed in claim 1 of U.S. Patent No. 6,625,364 B2.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 69-72 are rejected under 35 U.S.C. 102(a) as being anticipated by Kawanishi et al. (JP 2000-35521 A).

Regarding claims 1 and 69-72; Figure 3 of Kawanishi et al. discloses an optical waveguide comprising a dielectric core region (1) extending along a waveguide axis; and a dielectric confinement region (2) surrounding the core region (1) and extending along the waveguide axis, the confinement region comprising a photonic crystal structure having a photonic band gap, wherein during operation the confinement region guides EM radiation in at least a first range of frequencies to propagate along the waveguide axis; wherein the core (1) has an average refractive index smaller than

about 1.3 for a frequency in the first range of frequencies; wherein the core has a diameter (2a) in a range between about 4 and 80 times the wavelength corresponding to a central frequency in the first frequency range; wherein the dielectric confinement region extends transversely from the core for at least a distance of 10 times the wavelength corresponding to a central frequency in the first frequency range; and wherein the transverse dimension for the core is selected based on design criteria for guided EM radiation including cladding nonlinearity suppression and radiative losses (see the abstract).

Claims 69-72 are rejected under 35 U.S.C. 102(e) as being anticipated by Fink et al. (US 6,463,200 B2).

Regarding claims 69-72; Fink et al. discloses a method of designing a photonic crystal optical waveguide (600) including a dielectric core region (602) extending along a waveguide axis and a dielectric confinement region (layers 604, 606, 608, 610, 612, 614 and 616) surrounding the core about the waveguide axis, wherein the confinement region is configured to guide EM radiation in at least a first range of frequencies to propagate along the waveguide axis and wherein the core has an average refractive index smaller than about 1.3 for a frequency in the first range of frequencies, the method comprising selecting a transverse dimension for the core based on at least two or more design criteria for the guided EM radiation including mode separation, group-velocity dispersion radiative losses, absorption losses, and cladding nonlinearity suppression (see column 2, line 39, through column 8, line 47); wherein the upper limit for the transverse dimension of the core is selected based on the mode separation;

wherein a lower limit for the transverse dimension is selected based on at least one of the group-velocity dispersion, the radiative losses, the absorption losses, and the cladding nonlinearity suppression; wherein the confinement region comprises at least two dielectric materials having different refractive indices; and wherein the method further comprises selecting an index contrast for the different refractive indices based on at least one of the design criteria including the radiative losses, the absorption losses, and the cladding nonlinearity suppression.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fink et al. (US 6,463,200 B2).

Regarding claim 1; Fink et al. discloses all of the limitations of claim 1, except for specifically stating that the diameter of the core is in a range between 4λ and 80λ, and that the dielectric confinement region extends transversely from the core for at least a distance of 6λ or 10λ.

In Figures 6A and 6B, Fink et al. discloses an optical waveguide (600) comprising a dielectric core region (602) extending along a waveguide axis; and a dielectric confinement region (multilayer film including layers 604, 606, 608, 610, 612, 614, 616) surrounding the core (602) about the waveguide axis, the confinement region

comprising a photonic crystal structure having a photonic band gap, wherein during operation the confinement region guides EM radiation in at least a first range of frequencies to propagate along the waveguide axis; wherein the core (602) has an average refractive index smaller than about 1.1 (see column 1, lines 62-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diameter of the core be in a range between 4λ and 80λ, since Fink et al. does not disclose a specific value and/or range for the diameter of the core, Fink et al. does suggest that the size of the core can be varied (see column 7, lines 46-50), and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233.

Additionally, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the dielectric confinement region extend transversely from the core for at least a distance of 6λ or 10λ, since Fink et al. teaches that the parameters of the multilayer film comprising the dielectric confinement region (i.e. the thickness of film) is chosen such that light from any incident angle and polarization is completely reflected by the multilayer film for a selected range of signal frequencies, and it has been held that discovering an optimum value of a result effective variable involves only routing skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 63-65; Fink et al. teaches all of the limitations of claims 63-65 as applied to claim 1 above, except for the diameter of the core being in a range

between 5 and 170 microns, in a range between 7 and 100 microns, or in a range between 10 and 100 microns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diameter of the core be in a range between 5 and 170 microns, in a range between 7 and 100 microns, or in a range between 10 and 100 microns; since Fink et al. does not disclose a specific value and/or range for the diameter of the core, Fink et al. does suggest that the size of the core can be varied (see column 7, lines 46-50), and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233.

Claims 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawanishi et al. (JP 2000-35521 A).

Regarding claims 63-65; Kawanishi et al. teaches all of the limitations of claims 63-65 as applied to claim 1 above, except for the diameter of the core being in a range between 5 and 170 microns, in a range between 7 and 100 microns, or in a range between 10 and 100 microns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diameter of the core be in a range between 5 and 170 microns, in a range between 7 and 100 microns, or in a range between 10 and 100 microns; since Kawanishi et al. does not disclose a specific value and/or range for the diameter of the core, Kawanishi et al. does suggest that the size of the core can be varied, and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233.

Conclusion

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa
Patent Examiner
October 21, 2004